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Anthelmintic effects of forage chicory against parasitic nematodes in cattle

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BACKGROUND: Chicory (*Cichorium intybus*) has potential as a natural anthelmintic in livestock, however evidence of efficacy against cattle nematodes is lacking. Here, we investigated anthelmintic effects of chicory in stabled calves.
METHODS: Jersey male calves (2-4 months) were stratified by live weight and allocated randomly to 2 groups: chicory (CHI, n=9) and control (CON, n=6). CHI and CON calves were fed with forage chicory silage (cv. *Spadona*) and hay *ad libitum*, resp., for 8 weeks. After 2 weeks, calves were infected with 10,000 *Ostertagia ostertagi* and 65,000 *Cooperia oncophora* larvae. Fecal egg counts (FEC) and live weights were assessed weekly. Six weeks after infection, calves were slaughtered for worm recovery. In parallel, total sesquiterpene lactone (SL)-extracts from forage chicory (*Spadona* and cv. *Puna II*) were prepared and incubated with first-stage larvae (L1) of *O. ostertagi*. L1 viability was evaluated after 12 hours incubation.
RESULTS: Mean FECs (corrected for faecal dry matter) were not different between groups ($p=0.14$), but weight gains were higher in CHI calves (+ 35%; $p<0.05$). Mean worm counts for *O. ostertagi* adults were 1599 and 3752 in CHI and CON, respectively ($p<0.01$). Worm counting of *C. oncophora* is ongoing. SL extracts from *Spadona* chicory were toxic to *O. ostertagi* L1 *in vitro*, with a mortality of 99% at concentrations ≥ 500 mg/mL (EC_{50} =132.8 mg/mL). *Puna II*-SL extracts induced a L1 mortality of only 37% at the highest concentration tested (2000 mg/mL).
CONCLUSIONS: Based on these preliminary results, chicory silage (*Spadona*) has significant *in vivo* anthelmintic effects against *O. ostertagi,* possibly mediated by SL, and marked differences exist in the anti-parasitic activity of SL extracts from two different chicory cultivars.